CĂTĂLINA CANGEA

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PERSONAL PROFILE

Third-year PhD student at the University of Cambridge, focused on learning multimodal and graph-structured representations of the world. Born on May 17, 1994 in Ploieşti, România.

EDUCATION

Department of Computer Science and Technology, University of Cambridge, UK

PhD in Machine Learning (October 2017–2021 (expected))

MPhil in Advanced Computer Science (October 2016–July 2017) *Distinction (81%)*

BA in Computer Science (October 2013–June 2016) *First Class (75%) - 3rd year*

Colegiul Naţional "I.L.Caragiale", Ploieşti, România

Computer Science & Mathematics (September 2009–May 2013) *Valedictorian (grade 10/10)*

SELECTED RESEARCH PUBLICATIONS

Message Passing Neural Processes (joint first)

Neural Process with relational inductive bias for graph-structured datasets. Strong generalisation on Cellular Automata tasks, significant gains in arbitrary-labelling and few-shot tasks. Under review.

Graph Density-Aware Losses for Novel Compositions in Scene Graph Generation (third)

Novel density-normalized edge losses and weighted metrics for few/zero-shot scene graph generation, at no extra computational cost. Results on Visual Genome and GQA. Published at *BMVC 2020*.

Deep Graph Mapper: Seeing Graphs through the Neural Lens (joint first)

A fusion between Mapper (a Topological Data Analysis method) and graph neural networks that produces highly informative graph visualisations and a powerful pooling layer. Under review.

VideoNavQA: Bridging the Gap between Visual and Embodied Question Answering

Novel task that studies QA performance in EQA-like settings with nearly-ideal navigation paths. Generalised VQA models for temporal reasoning. Published at *BMVC 2019* and *NeurIPS ViGIL* spotlight.

Towards Sparse Hierarchical Graph Classifiers (joint first)

CNN-like architecture with sparse pooling for graph-structured data. Matched SOTA on benchmarks, memory reduced from $O(V^2)$ to $O(V + E)$. Presented at the *NeurIPS 2018 R2L Workshop*.

XFlow: Cross-modal Deep Neural Networks for Audiovisual Classification

Multimodal architectures with cross-modal dataflow. SOTA on benchmarks. Published in *IEEE TNNLS*. Presented at the *ARM Research Summit 2017* and *CMCML Workshop, ICDL-EPIROB 2017*.

PROFESSIONAL EXPERIENCE

Research Scientist Intern—DeepMind July 2020–October 2020

Hosted with Piotr Mirowski in the Lifelong and Embodied Deep Learning team led by Raia Hadsell.

Consultant—Relation Therapeutics   June 2020–July 2020

Developing (graph-)ML solutions to aid in drug development and repurposing efforts.

AI Resident—X, the moonshot factory   May 2019–August 2019

Worked on an early-stage project, using and adapting recent ML techniques to a real-world problem.

Research Intern—Mila   July 2018–September 2018

Collaboration with Aaron Courville on a visual reasoning project which resulted in a novel benchmark and alternative perspective on EQA-style tasks. BMVC publication and NeurIPS ViGIL spotlight talk.

Software Engineer Intern—Facebook London   June 2016–September 2016

Worked on the LogDevice team, making client operations on a distributed RocksDB data store more efficient and flexible, while leading to fewer system failures.

Software Engineer Intern—Facebook New York   July 2015–September 2015

Worked on iOS Product Infrastructure to reduce the time taken by the Facebook iOS app to load content close to the screen current view. Improved the infrastructure and network request prioritisation system.

STEP Intern—Google Zürich   June 2014–September 2014

Added processing progress for video uploads on YouTube. Developed a JavaScript client implementation that requests processing information from the server and thumbnail rendering of processing videos.

PROFESSIONAL SKILLS

Programming Languages	Python, C, C++, Standard ML, Java, C#, Objective-C, JavaScript
Machine Learning APIs	JAX, PyTorch, Keras, TF1, PyG, Haiku, Graph Nets, Sonnet, CUDA

TEACHING / SUPERVISING

Lectures: *Graph Generation Methods - R250 Advanced Topics in ML and NLP (Master's course)* (2020)

Master's projects: *"Goal-conditioned Reinforcement Learning in the Presence of an Adversary"* (2019–20), *"Representation Learning for Spatio-Temporal Graphs"* (2018–19) (ICLR RLGM), *"Dynamic Temporal Analysis for Graph Structured Data"* (2018–19) (ICLR RLGM)

Undergraduate projects: *"Deep Learning for Music Recommendation"* (2017–18), *"The PlayStation Reinforcement Learning Environment"* (2018–19) (NeurIPS DeepRL), *"Benchmarking Graph Neural Networks using Wikipedia"* (ICML GRL+), *"Multimodal Relational Reasoning for Visual Question Answering"* (2019–20)

Undergraduate courses: Artificial Intelligence, Databases, Discrete Maths, Foundations of Computer Science, Logic and Proof, Machine Learning and Real-World Data

EXTRACURRICULAR ACTIVITIES

Chair/Deputy chair, women@CL, University of Cambridge	October 2018–July 2020
Machine Learning Teaching Fellow, Cambridge Spark	May 2018–present

LANGUAGES

English (fluent), French (beginner), Romanian (native)

INTERESTS

Music	Guitar and vocals in a rock band—we play in colleges, pubs and at Cambridge May Balls
Rowing	King's Women's First Boat (Jan 2018–present), Darwin/King's Second Boat (Jan–Dec 2017)